

SUBMISSION WITH REPLY TO OFFICE ACTION

In the Final Office Action mailed April 13, 2004, Claims 1-5 and 7 were rejected under 35 U.S.C. 103(a) as being obvious over U.S. Patent No. 3,215,579 to Hagen in view of U.S. Patent No. 2,229,621 to Bradner. The rejection is respectfully traversed.

In his accompanying 37 C.F.R. §1.132 Declaration, Dr. Fritz G. Paulsen states that one skilled in the art would understand from what is taught in the '579 patent that the "paper web" sized by Hagen is **finished paper** – not paper which is in the process of being formed on-machine. Indeed, in each of his examples Hagen specifically applies his salt solution to "a roll of standard saturating-type kraft paper" (see: col. 4, line 70-71; col. 5, lines 19-26; col. 5, lines 49-52; and col. 5, lines 69-73).

As noted by Dr. Paulsen, what Hagen teaches to those skilled in the art is the production of a release sheet wherein dry formed paper is subsequently post-treated in a separate sizing operation with an aqueous solution of water-soluble alkaline earth or alkaline earth metal salts. The wet, sized paper is dried, then impregnated throughout with a phenolformaldehyde resin solution, and dried again. The impregnated dried paper is finally coated with an alginic acid salt film (see '579 patent examples). However, there are a number of problems associated with Hagen's method. Evidence of the problems inherent in the Hagen method is exhibited by the fact that the assignee of the '579 patent (the Formica Corporation) subsequently filed applications which matured into U.S. Patent Nos. 4,243,461 and 4,263,073. Both of these patents noted (col. 2, lines 38-57) that the sized release sheet taught by Hagen absorbed a great deal of sizing agent and alginic salt, and that **this excessive absorption frequently resulted in inferior release when used to separate decorative laminates undergoing consolidation**. Indeed, both the '461 patent (col. 2, lines 50-55) and the '073 patent (col. 2, lines 52-57) specifically state that:

Large amounts of alginic salt, even when applied in sequential layers does not improve these deficiencies. **Only by incorporating a phenolic resin was Hagen able to produce a satisfactory release sheet.** The use of such a resin, before sizing, is very costly.

The Hagen reference does not teach or suggest the application of an aqueous solution of at least one multivalent salt to at least one surface of a cellulosic-based paper substrate while the substrate is being formed on-machine. In paragraph 0016 of the application it is noted that the salts employed in the applicants' method exhibit a multivalent ionic charge. The multivalent charge permits the salt ions to displace ions attached to the acid groups on the alginate so that the salt cross-links the alginate polymer. This action increases the viscosity of the coating, thereby inhibiting the polymer's penetration of the sheet. This improves the holdout of the release coating, which provides enhanced release performance.

As Dr. Paulsen notes, the applicants' method significantly improves upon the process taught by Hagen and other traditional processes by eliminating the expensive post-treatment sizing operation. In the applicants' method, an aqueous solution of at least one multivalent salt is applied to at least one surface of a cellulosic-based paper substrate while the substrate is being formed on-machine. The substrate is then coated on at least one salt-treated side with a film of a salt of alginic acid and employed as a release sheet in laminate production.

As the basis for the rejection the Office Action states (p. 4, lines 4-6) that, "However, it is well known is the paper making arts to provide a sizing coating to a paper substrate while the paper substrate is still 'on the forming machine' in order to reduce costs". It is certainly known to apply certain types of sizing coatings to a paper substrate while the paper substrate while the paper substrate is still on-machine. However, as stated by Dr. Paulsen in the accompanying Declaration, prior to the applicants' invention it was believed by those skilled in the art that the application of salts as taught by the applicant on-machine to a cellulosic-based paper substrate (such as saturating kraft paper and the like) was not feasible due to absorption problems and other potential adverse effects to both the substrate and the paper machine.

Evidence of the absorption problems inherent in the production of traditional release sheets is found in U.S. Patent No. 4,510,199 (col. 1, line 35 – col. 2, line 6) which states:

Recently, attempts have been made to produce in-house release sheets from standard Kraft paper core stock, to reduce cost, handling, and sanding operations. In Emily Jr. et al., U.S. Pat. No. 3,050,434, Kraft paper core sheet was impregnated with phenolic resin and then coated with a film of the salt of an alginic acid, such a sodium alginate, for use as a

release sheet. After release, sanding off the alginate film was usually required. It was found, however, that **the alginate salt was mostly absorbed by the paper, with resultant release problems.** Hagen, in U.S. Pat. No. 3,215,579, first sized the Kraft paper core sheet with an aqueous solution of a water soluble alkaline earth or alkaline earth metal salt, such as calcium chloride and the like, before impregnating with phenolic resin, and finally coating with a film of the salt of an alginic acid.

Even the Hagen triple operation seemed to present **problems of salt absorption, release, and cost**, and so, Jaisle et al., in U.S. Pat. No. 4,263,073, eliminated the phenolic resin completely, and used **a particular type of paper web having a water absorption of at least 200 seconds.** The use of this special paper caused the alginate salt to be retained on the surface fibers of the release sheet, with substantially no penetration or loss into the interior of the release sheet, thus functioning better as a release.

Jaisle et al. then went on, to further improve the release, in U.S. Pat. No. 4,243,461, by including either a triglyceride or a hydrolyzed or non-hydrolyzed lecithin with the alginate salt used to coat the resin-free, highly surface absorbent, special 200 second series paper. With both Emily Jr. and Hagen, **alginate penetration of the release sheet seemed to pose a problem, so that substantial sanding was required.** Jaisle et al., in addition to using specialized paper, would also require complete sanding because the paper was not resin impregnated with phenolic resin, as was the core. **What is still needed is a simple, inexpensive, in-house method of making release sheets, and releasing laminates from one another, requiring minimum sanding.**

As noted above, the absorptive properties of Kraft paper substrates result in significant problems being encountered with even the relatively simple procedure of applying water-soluble salt solutions off-machine to such cellulosic-based paper substrates which have already been dry formed. It is respectfully submitted that one skilled in the art would reasonably expect these absorption problems to be significantly magnified if one was to attempt to apply an **aqueous solution of water-soluble multivalent salt** on-machine during formation of cellulosic-based paper substrates due to the physical characteristics of the substrate during formation.

Furthermore, applications of salt-solutions to paper substrates have also had various adverse effects to machines employed in the processes. Evidence of such problems is found in the August 23, 1994, **Technical Memorandum** submitted in the accompanying Information Disclosure Statement regarding the corrosivity of calcium salt solutions.

It was, therefore, totally unexpected that such water-soluble salts could be applied on-machine during formation of cellulosic-based paper substrate in such a manner as to ensure that the substrate retained a sufficient amount of salt on its surface to permit effective cross-linking of the

alginate. Evidence of this effective salt retention is shown in **Picture 1** submitted in the accompanying Information Disclosure Statement, which clearly shows the surface retention of the calcium propionate in amounts sufficient to permit effective cross-linking of the alginate. Moreover, the applicants have found that a relatively small application of salts on-machine is effective, as the evaporation of liquid from the surface of the substrate and other conditions act to slow absorption by the substrate of the salt solution.

It is respectfully submitted that the mere fact that “it is well known is the paper making arts to provide a sizing coating to a paper substrate while the paper substrate is still ‘on the forming machine’ in order to reduce costs” does not mean that the applicants’ method on applying solutions of water-soluble salts on-machine is obvious. **Indeed, it is important to note that none of the references cited in the Office Action teaches, suggests, or even hints at the application on-machine of an aqueous solution of water-soluble multivalent salt(s) to cellulosic-based paper substrates.** It is respectfully submitted that the reason that no reference teaching such an application has been cited in the present case is that none exists, as the success of such an on-machine application was solutions of water-soluble salts totally unexpected due to the solubility of the salts, the nature of the on-machine environment, and the physical characteristics of the paper during formation.

The Office Action cites Bradner as disclosing a method of sizing a paper substrate with an aqueous coating composition where the sizing is applied during the formation of the substrate on-machine. However, it is respectfully submitted that one skilled in the art would recognize that both the method and the coating compositions taught by Bradner significantly differ from method and the aqueous salt solutions taught by the applicants.

For example, Bradner teaches and claims the use of coating compositions which contain **solids in liquid suspension** which is applied in such a manner as to form a **firm filter cake layer** of the solids covering the surface of the paper (see claims 1, 2, 4, 5, 7, 8, and 9). After formation of the filter cake layer substantially all of the liquid coating is wiped off without removing substantially any of the filter cake layer from the paper’s surface. The formation of the firm filter cake covering layer is essential to the processes taught by Bradner (see col. 1, lines 33 – 39; col. 2, lines 18 – 27; and col. 9, lines 65-66). Bradner further teaches that his coating composition is usually an aqueous

suspension of finely divided mineral filler (which are water-insoluble) with an adhesive (col. 5, lines 29-31).

As noted by Dr. Paulsen, one skilled in the art would recognize that the aqueous solutions of water-soluble multivalent salt(s) taught and claimed by the applicants are significantly different from the liquid solids suspensions taught and claimed by Bradner. Moreover, the formation of a filter cake layer of solids covering the surface of the paper is essential to the method taught by Bradner. In contrast, the method taught by the applicants cannot form such a layer due to the **water-solubility of the multivalent salt(s)**. Furthermore, a skilled artisan would understand that paper having a surface coated with a solids filter cake as taught by Bradner would not be suitable for use in the production of high pressure laminates, as such a coating would adversely affect the resin absorption and saturation properties of the paper.

The Office Action states that “one of the examples of sizing coatings that Bradner lists is a salt coating (calcium carbonate)”. One skilled in the art would recognize that calcium carbonate is not a water-soluble multivalent salt, and is only partially-soluble under acidic conditions. It is believed that the only coating compositions listed by Bradner which contain calcium carbonate are those included in example 1. These compositions contain 15-16% calcium carbonate (pigment), 21–22% coating clay (pigment), 4% casein (adhesive) dissolved in ammonia water, and 58-60% water. As noted by Dr. Paulsen, one skilled in the art would recognize that calcium carbonate is employed under alkaline conditions as a **water-insoluble** solid pigment in these coating compositions.

Thus, it is clear that Bradner merely teaches the application of compositions containing **water-insoluble components**. Bradner does not teach or suggest the application on-machine of an aqueous solution of water-soluble salt(s) to cellulosic-based paper substrates.

It is respectfully noted that U.S. Patent No. 2,229,621 to Bradner issued on January 21, 1941, and that U.S. Patent No. 3,215,579 to Hagen issued on November 2, 1965 – so that **this combination of references has been available to the public for over 37 years**. However, to our knowledge no one has attempted the application on-machine of an aqueous solution of water-soluble salt(s) to cellulosic-based paper substrates prior to the applicants’ invention. However, as Dr. Paulsen notes there has been a long felt but unsatisfied need for an improved method of releasing laminates, specifically for release sheets having enhanced release characteristics for use in the

production of laminates. Evidence of this long felt need and the fact that those skilled in the art were working on this problem is clearly shown in U.S. Patent Nos. 4,243,461; 4,263,073; and 4,510,199 noted above. Further evidence of the long felt need and the efforts to address that need is shown in Dr. Paulsen's listing of **66 experimental machine trials** ran by Westvaco Corporation over the period of 1994-2001 in attempts to develop release sheets with enhanced release characteristics. The method taught by the applicants has satisfied this need. Indeed, the applicants' invention has achieved significant commercial success due to its enhanced release characteristics, with over **13,000 tons** of applicants' release paper being sold by MeadWestvaco Corporation in the calendar year of 2003 for use in the production of laminates.

It is, therefore, respectfully submitted that neither Hagen nor Bradner, either alone or in combination, would teach or suggest the applicants' improved method of releasing laminates to a skilled artisan – much less that the method would be successful.

Claim 6 stands rejected under 35 U.S.C. 103(a) as being obvious over U.S. Patent No. 3,215,579 to Hagen (optionally in view of U.S. Patent No. 2,229,621 to Bradner) as applied to claim 1 above, and further in view of U.S. Patent No. 6,171,702 to Malhotra et al. The rejection is respectfully traversed.

The comments noted above concerning Hagen and Bradner are also applicable to the present rejection. Malhotra et al. is cited by Office Action as disclosing "an example of a method of coating paper where the water soluble salt is calcium propionate (column 4, lines 55-61). However, it should be noted that the papers taught by Malhotra et al. are those "capable of absorbing fuser oils particularly suitable for use in electrophotographic systems that employ oil containing fuser rolls that heat and fix the developed image" (col. 3, lines 39-42). These xerographic papers have four layers, wherein the first front side layer in contact with the substrate is an "antistatic hydrophilic layer" comprising (1) a hydrophilic binder, (2) a water soluble filler, (3) a water insoluble filler, (4) an antistatic component, (5) an optional filler dispersant, and (6) an optional biocide (see claim 1). The water soluble filler of this layer may further be (1) inorganic salts, (2) organic salts, and (3) mixtures thereof (see claim 8) – and may further be calcium propionate (see claim 9).

As noted by Dr. Paulsen, it is respectfully submitted that one skilled in the art would recognize that antistatic hydrophilic layer coating taught by Malhotra et al. significantly differs from

the aqueous salt solutions taught by the applicants. Also, it is believed that the xerographic papers taught by Malhotra et al. would not be suitable for use in the production of high pressure laminated materials.

Thus, it is clear that Malhotra et al. merely teaches the application of compositions containing **water-insoluble components**. Malhotra et al. does not teach or suggest the application on-machine of an aqueous solution of water-soluble salt(s) to cellulosic-based paper substrates.

It is, therefore, respectfully submitted that the teachings contained in Hagen, Bradner, and Malhotra et al., either alone or in combination, would not explicitly or implicitly teach or suggest the applicants' improved method of releasing laminates to a skilled artisan – much less that the method would be successful.

It is further respectfully submitted that, in the absence of the applicants' teachings, there would be no suggestion or motivation to one skilled in the art to even attempt to combine the Hagen, Bradner, and Malhotra et al. references – and that such an attempted combination would invariably be the result of improper hindsight analysis. As the court stated in *W. L. Gore & Associates, Inc. v. Garlock, Inc.*, 721 F.2d 1540, 220 U.S.P.Q. 303 (1983):

To imbue one of ordinary skill in the art with knowledge of the invention in suit, when no prior art reference or references or record convey or suggest that knowledge, is to fall victim to the insidious effect of a hindsight syndrome wherein that which only the inventor taught is used against its teacher.

Therefore, for the reasons stated, it is respectfully submitted that the claimed invention is patentable and that the claims are in condition for allowance. Such action by the Examiner is earnestly solicited.

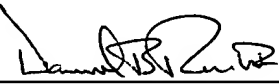
If the Examiner believes, for any reason, that personal communication will expedite the prosecution of this application, the Examiner is invited to telephone the undersigned at the number provided.

Authorization was provided on the accompanying Request For Continued Examination (RCE) Transmittal sheet [Form PTO/SB/30 (09-04)] for the charging of the assignee's Deposit Account for the required fees for the Request for Continued Examination (RCE) under 37 CFR

§1.114, and the Request for Suspension of Action under 37 CFR §1.103(c). No additional fees are believed to be due in connection with this filing. However, should it be determined that additional fees are due and payable, the Commissioner is authorized to charge any required fees or credit any overpayment to the assignee's Deposit Account No. **23-1160**.

Respectfully submitted,

MEADWESTVACO CORPORATION

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Attachment

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